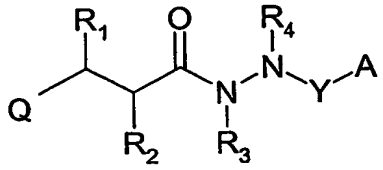
Claims

1. A compound of formula (I) or a pharmaceutically or veterinarily acceptable salt, hydrate or solvate thereof



(I)

wherein

Q represents a radical of formula -N(OH)CH(=O) or formula -C(=O)NH(OH);

Y represents -C(=O)-, -C(=S)-, -S(=O)-, or $-SO_2-$;

R_1 represents hydrogen, C_1-C_6 alkyl or C_1-C_6 alkyl substituted by one or more halogen atoms, or, except when Q is a radical of formula -N(OH)CH(=O), a hydroxy, C_1-C_6 alkoxy, C_1-C_6 alkenyloxy, halogen, amino, C_1-C_6 alkylamino, or di-(C_1-C_6 alkyl)amino group;

R_2 represents a substituted or unsubstituted C_1-C_6 alkyl, C_1-C_3 alkyl-O-C_1-C_3 alkyl, C_1-C_3 alkyl-S-C_1-C_3 alkyl, cycloalkyl(C_1-C_3 alkyl)-, aryl(C_1-C_3 alkyl)-, heterocyclyl(C_1-C_3 alkyl)-, or R^1R^2N-C_1-C_3 alkyl group wherein R^1 represents hydrogen or C_1-C_3 alkyl and R^2 represents C_1-C_3 alkyl, or R^1R^2N- represents a cyclic amino group;

R_3 and R_4 taken together with the nitrogen atoms to which they are respectively attached form a saturated heterocyclic ring of from 4 to 7 ring atoms, which may be fused to a second carbocyclic or heterocyclic ring, either of which rings may optionally be substituted; and

A represents a primary, secondary or tertiary amino group or a group $-R_5$, $-OR_5$, wherein R_5 is a substituted or unsubstituted C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl,

cycloalkyl, aryl, heterocyclyl, C_1-C_3 alkyl-O-C_1-C_3 alkyl, C_1-C_3 alkyl-S-C_1-C_3 alkyl, cycloalkyl(C_1-C_3 alkyl)-, heterocyclic(C_1-C_3 alkyl, aryl(C_1-C_3 alkyl)-, or R^1R^2N-C_1-C_3 alkyl group wherein R^1 represents hydrogen or C_1-C_3 alkyl and R^2 represents C_1-C_3 alkyl, or R^1R^2N- represents a cyclic amino group.

2. A compound as claimed in claim 1 wherein Q is an N-formyl hydroxylamine group -N(OH)CH(=O).

3 A compound as claimed in claim 1 or claim 2 wherein -Y- is -C(=O)- or SO_2.

4. A compound as claimed in any of the preceding claims wherein R_1 is hydrogen.

5. A compound as claimed in any of the preceding claims wherein R_2 is

optionally substituted C_1-C_6 alkyl, C_3-C_6 alkenyl, C_3-C_6 alkynyl or cycloalkyl;

phenyl(C_1-C_6 alkyl)-, phenyl(C_3-C_6 alkenyl)- or phenyl(C_3-C_6 alkynyl)- optionally substituted in the phenyl ring;

cycloalkyl(C_1-C_6 alkyl)-, cycloalkyl(C_3-C_6 alkenyl)- or cycloalkyl(C_3-C_6 alkynyl)- optionally substituted in the cycloalkyl ring; or

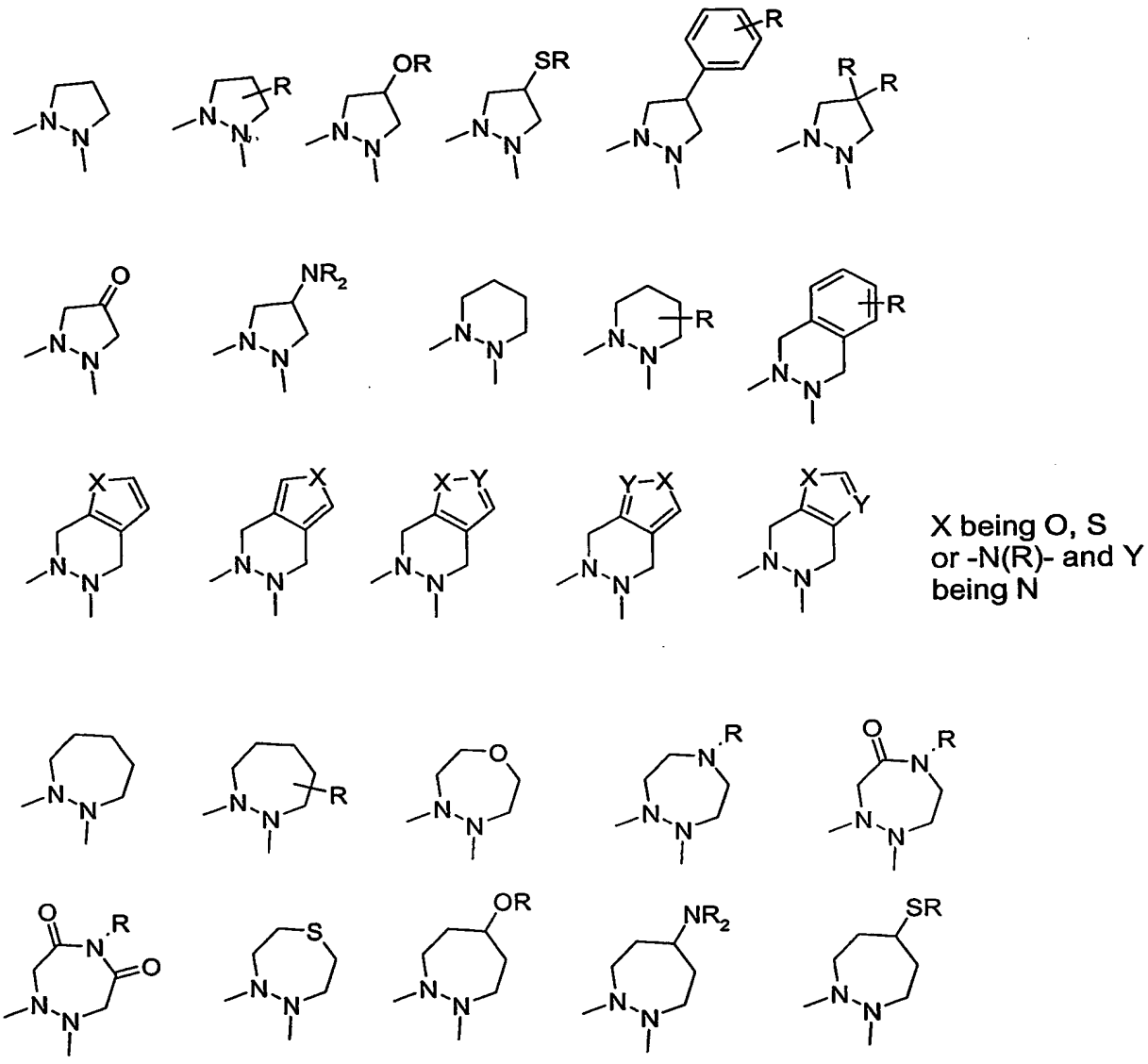
$CH_3(CH_2)_pO(CH_2)_q$- or $CH_3(CH_2)_pS(CH_2)_q$-, wherein p is 0, 1, 2 or 3 and q is 1, 2 or 3.

6. A compound as claimed in any of claims 1 to 4 wherein R_2 is methyl, ethyl, n- or iso-propyl, n- or iso-butyl, n-pentyl, iso-pentyl, 3-methyl-but-1-yl, n-hexyl, n-heptyl, n-acetyl, n-octyl, methylsulfanylethyl, ethylsulfanylmethyl, 2-methoxyethyl, 2-ethoxyethyl, 2-ethoxymethyl, 3-hydroxypropyl, allyl, 3-phenylprop-3-en-1-yl, prop-2-yn-1-yl, 3-phenylprop-2-yn-1-yl, 3-(2-chlorophenyl)prop-2-yn-1-yl, but-2-yn-1-yl, cyclopentyl, cyclohexyl, cyclopentylmethyl, cyclopentylethyl, cyclopentylpropyl,

acyclohexylmethyl, cyclohexylethyl, cyclohexylpropyl, furan-2-ylmethyl, furan-3-methyl, tetrahydrofuran-2-ylmethyl, tetrahydrofuran-2-ylmethyl, piperidinylmethyl, pyrid-2-ylmethyl, pyrid-3-ylmethyl, pyrid-4-ylmethyl, phenylpropyl, 4-chlorophenylpropyl, 4-methylphenylpropyl, 4-methoxyphenylpropyl, benzyl, 4-chlorobenzyl, 4-methylbenzyl, or 4-methoxybenzyl.

7. A compound as claimed in any of claims 1 to 4 wherein R_2 is (C_1-C_6)alkyl-, cycloalkylmethyl-, (C_1-C_3)alkyl-S-(C_1-C_3)alkyl-, or (C_1-C_3)alkyl-O-(C_1-C_3)alkyl-, especially n-propyl, n-butyl, n-pentyl, cyclopentylmethyl, cyclopentylethyl, cyclohexylmethyl or cyclohexylethyl.

8. A compound as claimed in any of the preceding claims wherein the ring formed by R_3 and R_4 and the nitrogens to which they are attached is one of the following, any of which may be optionally substituted, and wherein R represents hydrogen or C_1-C_4 alkyl and any sulfur atom present as a ring member may be oxidised to -SO- or $-SO_2-$:



9. A compound as claimed in any of the preceding claims wherein A is a secondary amino group or a cyclic or non-cyclic tertiary amino group.

10. A compound as claimed in any of claims 1 to 8 wherein A is an amino group of formula - NR_6R_7 wherein R_6 and R_7 independently represent a radical of formula (II)

$$-(Alk^1)_m-(X)_p-(Alk^2)_n-Z \qquad (II)$$

wherein

m, p and n are independently 0 or 1;

Z represents hydrogen or a carbocyclic or heterocyclic ring of 5 to 7 ring atoms which is optionally fused to a saturated or unsaturated carbocyclic or heterocyclic second ring of 5 to 7 ring atoms;

Alk^1 and Alk^2 independently represent divalent C_1-C_3 alkylene radicals;

X represents -O-, -S-, -S(O)-, -$S(O_2)$-, -C(=O)-, -NH-, -NR_7- where R_7 is C_1-C_3 alkyl;

and wherein
Alk^1, Alk^2 and Z when other than hydrogen, independently are optionally substituted by

(C_1-C_3)alkyl, (C_2-C_3)alkenyl, or (C_2-C_3)alkynyl,
phenyl, optionally substituted by (C_1-C_3)alkyl, (C_1-C_3)alkoxy, halo, nitro, amino, mono- or di-(C_1-C_3)alkylamino, cyano or trifluoromethyl;

monocyclic 5 or 6-membered heterocyclic, optionally substituted by (C_1-C_3)alkyl, (C_1-C_3)alkoxy, halo, nitro, amino, mono- or di-(C_1-C_3)alkylamino, cyano or trifluoromethyl
benzyl, optionally substituted in the phenyl ring by (C_1-C_3)alkyl, (C_1-C_3)alkoxy, halo, nitro, amino, mono- or di-(C_1-C_3)alkylamino, cyano or trifluoromethyl,
hydroxy, phenoxy, (C_1-C_6)alkoxy, or hydroxy(C_1-C_6)alkyl,
mercapto, (C_1-C_6)alkylthio or mercapto(C_1-C_6)alkyl,
oxo,
nitro,
cyano
halo
-COOH, or -$COOR^A$,
-$CONH_2$, -$CONHR^A$, or -$CONR^AR^B$

$-COR^A$, $-SO_2R^A$,

$-NHCOR^A$,

$-NH_2$, $-NHR^A$, or $-NR^AR^B$,

wherein R^A and R^B are independently a (C_1-C_6) alkyl group, R^A and R^B taken together with the nitrogen atom to which they are attached form a 5- or 6-membered heterocyclic ring which may be substituted by (C_1-C_3)alkyl, hydroxy, or hydroxy(C_1-C_3)alkyl.

11. A compound as claimed in claim 10 wherein Alk^1 and Alk^2 independently represent $-(CH_2)-$ or $-(CH_2CH_2)-$.

12. A compound as claimed in claim 10 or claim 11 wherein m is 0, p is 1, n is 0 or 1 and X is $-C(=O)-$ or $-S(O_2)-$.

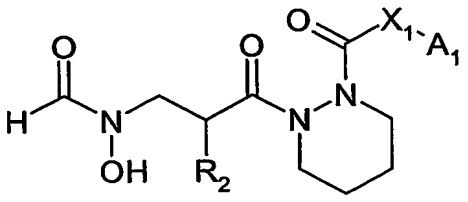
13. A compound as claimed in claim 10 wherein the substituent (II) has the formula $-CH_2Z$, -OZ, or $-(C=O)Z$ wherein Z is C_1-C_3 alkyl, phenyl, 3,4-methylenedioxyphenyl, morpholinyl, pyrimidinyl, 1,2,3-thiadiazolyl, 1,4-thiazolyl, benzofuranyl, furanyl, thienyl, pyranyl, pyrrolyl, pyrazolyl, isoxazolyl, or pyridyl, any of which may optionally be substituted as specified. In particular, Z may be a methyl, ethyl, n- or iso-propyl, phenyl, 3,4-methylenedioxyphenyl, morpholinyl, pyrimidin-2-yl, 1,2,3-thiadiazol-5-yl, 1,4-thiazol-5-yl, benzofuran-2-yl, 2-or 3-furanyl, 2- or 3-thienyl, 2- or 3-pyranyl, 2-, 3- or 4-pyrrolyl, 3-, 4- or 5-pyrazolyl, 3-, 4- or 5-isoxazolyl, or 2-, 3- or 4-pyridyl ring any of which may optionally be substituted as specified in the broad description of the compounds of the invention.

14. A compound as claimed in any of claims 1 to 8 wherein A is an amino group of formula $-NR_6R_7$ wherein R_6 and R_7 taken together with the nitrogen atom to which they are attached form a saturated heterocyclic ring of 5 to 8 atoms optionally fused to a saturated or unsaturated carbocyclic or heterocyclic second ring of 5 to 7 ring atoms, any of which rings being optionally substituted by a radical of formula (II) as

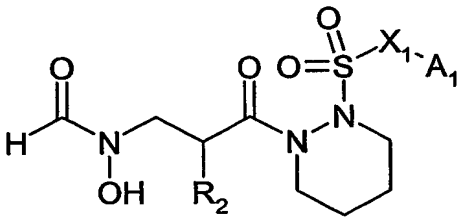
defined in any of claims 10 to 13.

15. A compound as claimed in claim 14 wherein A is optionally substituted piperidin-1-yl or 1-piperazinyl.

16. A compound as claimed in claim 1 of formula (IIA) or (IIB)



(IIA)



(IIB)

wherein R_2 is as defined in claim 1;

X_1 is a bond, C_1-C_3 alkylene, -NH- or -O-; and

A_1 is optionally substituted C_1-C_6 alkyl, cycloalkyl, aryl, or heterocyclic.

17. A compound as claimed in claim 16 wherein R_2 is n-propyl, n-butyl, n-pentyl, cyclopentylmethyl, cyclopentylethyl, cyclohexylmethyl or cyclohexylethyl;

X_1 is a bond, -CH_2-, -CH_2CH_2-, -$CH_2CH_2CH_2$-, -NH- or -O-; and

A_1 is methyl, ethyl phenyl, cyclopentyl, cyclohexyl, 2- or 3-furanyl, 2- or 3- thienyl, 2-, 3- or 4-pyridyl, 3-, 4- or 5-pyrazolyl, 3-, 4- or 5-oxazolyl, or 3-, 4- or 5-thiazolyl, methoxymethyl, 3,5-bis-(trifluoromethyl)phenyl, 4-trifluoromethylphenyl, 4-methoxyphenyl, 3,4-methylenedioxyphenyl, 4-fluorophenyl benzyl, 3-pyridyl, 4-pyridyl, cyclohexyl, 1,3-dimethylpyrazol-5-yl, 1-methylimidazol-5-yl, or 2-[morpholin-1-yl]pyrid-5-yl.

18. A method for the treatment of bacterial infections in humans and non-human

mammals, which comprises administering to a subject suffering such infection an antibacterially effective dose of a compound as claimed in any of the preceding claims.

19. The use of a compound as claimed in any of claims 1 to 17 for inhibiting bacterial growth in vitro and in vivo in mammals.

20. The use of a compound as claimed in any of claims 1 to 17 for the manufacture of a composition for treating bacterial infection by inhibiting bacterial growth.

21. A method for the treatment of bacterial contamination by applying an antibacterially effective amount of a compound as claimed in any of claims 1 to 17 to the site of contamination.

22. A pharmaceutical or veterinary composition comprising a compound as claimed in any of claims 1 to 17 together with a pharmaceutically or veterinarily acceptable carrier or excipient.